

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Withdrawn) A unit-layer post-treatment catalyst chemical-vapor-deposition apparatus for forming a thin film on a substrate by using the catalyst action of an exothermic catalyst body resistance-heated in a reactive vessel capable of performing vacuum pumping, comprising: a gas supply system capable of introducing flow rates of thin-film-component-contained gas and hydrogen gas into the reactive vessel like a pulse; and an exhaust system capable of performing vacuum pumping and pressure control, wherein the above thin-film-component-contained gas and hydrogen gas introduced like a pulse contact with the exothermic catalyst body and decompose and form a thin film for each unit layer on the substrate, and form a laminated thin film by surface-treating the thin film for each unit layer.

2. (Withdrawn) The unit-layer post-treatment catalyst chemical-vapor-deposition apparatus according to claim 1, characterized in that the surface treatment is one or both of the surface treatment by thin-film-component-contained gas excluding silicon and containing active species and the surface treatment by hydrogen gas containing active species.

3. (Withdrawn) The unit-layer post-treatment catalyst chemical-vapor-deposition apparatus according to claim 1, characterized in that the catalyst performance is regenerated by applying hydrogen gas to the exothermic catalyst body.

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4. (Withdrawn) The unit-layer post-treatment catalyst chemical-vapor-deposition apparatus according to claim 1, characterized in that the surface treatment is one or both of the extracting treatment of surplus thin-film component and direct adding treatment of a thin-film component.

5. (Withdrawn) The unit-layer post-treatment catalyst chemical-vapor-deposition apparatus according to claim 1, characterized in that one of nitrogen gas and rare gas is used instead of the hydrogen gas.

6. (Withdrawn) The unit-layer post-treatment catalyst chemical-vapor-deposition apparatus according to claim 1, characterized in that the thin-film-component-contained gas is made of at least one of hydride of silicon and halide of silicon, and at least one of nitrogen and hydride of nitrogen.

7. (Withdrawn) The unit-layer post-treatment catalyst chemical-vapor-deposition apparatus according to claim 1, characterized in that the thin-film-component-contained gas containing active species in the surface treatment is one or both of nitrogen and hydride of nitrogen.

8. (Currently Amended) ~~A unit-layer post-treatment film forming method which is a catalyst chemical-vapor-deposition method for forming a thin film on a~~

substrate by using the catalyst action of an exothermic catalyst body resistance-heated in a reactive vessel capable of performing vacuum pumping, comprising:

an activating step of introducing pulsed flows ~~[[rates]]~~ of thin-film-component-contained gas and hydrogen gas like a pulse, bringing the gases into contact with the exothermic catalyst body, and generating active species of the gases;

a film forming step of forming a thin film for each unit layer on a substrate; ~~[[and]]~~

a surface treating step of surface-treating ~~performing surface treatment of a~~ the thin film for every unit layer by hydrogen gas ~~containing~~ active species~~[[, and]]~~;

another surface treating step of surface-treating ~~[[a]]~~ the thin film for every unit layer by thin-film-component-contained-gas ~~including~~ active species~~[[,]]~~; and

repeating one of the one surface treating step and the other surface treating step during one cycle,

wherein the surface treating step and the other surface treating step can be carried out in any order~~[[,]]~~, and

wherein ~~characterized in that~~ a laminated thin film is formed by using a series of steps for respectively performing surface treatment after forming a film as one cycle, and repeating a plurality of cycles.

9. (Currently Amended) The ~~unit-layer post-treatment film forming~~ method according to claim 8, ~~characterized by~~ further comprising repeating one of the one surface treating step and other surface treating step a plurality of times during one cycle.

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10. (Currently Amended) The ~~unit-layer post-treatment film forming~~ method according to claim 8, ~~characterized in that~~ wherein said film forming step and one or both of ~~[[the]]~~ said one surface treating step and said other surface treating step ~~and a film forming step of forming a thin film for each unit layer on a substrate are~~ performed continuously ~~performed~~.

11. (Currently Amended) The ~~unit-layer post-treatment film forming~~ method according to claim 8, ~~characterized by~~ further comprising vacuum-pumping remaining gas after one of the film forming step, the one surface treating step and the other surface treating step.

12. (Currently Amended) The ~~unit-layer post-treatment film forming~~ method according to claim 8, ~~characterized in that~~ wherein the one surface treating step is ~~a step of~~ extracting a surplus thin-film component and the other surface treating step is ~~a step of~~ adding a thin-film component.

13. (Currently Amended) The ~~unit-layer post-treatment film forming~~ method according to claim 8, ~~characterized in that~~ wherein the final step of one cycle is ~~a step of~~ performing surface treatment by thin-film-component-contained gas active species ~~excluding silicon and containing active species~~.

14. (Currently Amended) The ~~unit-layer post-treatment film forming~~ method according to claim 8, ~~characterized in that~~ wherein one of nitrogen gas and an

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~~inert~~ ~~[[rare]]~~ gas is used ~~instead of the~~ in addition to hydrogen gas.

15. (Currently Amended) The ~~unit layer post-treatment film forming~~ method according to claim 8, ~~characterized in that~~ wherein the thin-film-component-~~contained~~ gas is made of at least one of a hydride of silicon and a halide of silicon, and at least one of nitrogen and a hydride of nitrogen.

16. (Currently Amended) The ~~unit layer post-treatment film forming~~ method according to claim 8, ~~characterized in that~~ wherein the thin-film-component-~~contained~~ gas ~~including~~ active species in the surface treatment is one or both of nitrogen and a hydride of nitrogen.

17. (Currently Amended) The ~~unit layer post-treatment film forming~~ method according to claim 8, ~~characterized in that~~ wherein the thin-film-component-~~contained~~ gas is made of a monosilane gas and ammonia gas, the film forming step forms a silicon nitride film for each unit layer on a substrate, and the other surface treating step is ~~a step of~~ surface-treating a silicon nitride film for each unit layer by ammonia gas ~~including~~ active species.

18. (Currently Amended) The ~~unit layer post-treatment film forming~~ method according to any one of claims 15 to 17, ~~characterized in that~~ wherein the final step of one cycle is ~~a step of~~ performing surface treatment by ammonia gas which is ~~thin-film component-contained gas including~~ active species.